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EXECUTIVE SUMMARY

Asthma is a chronic inflammatory lung disease characterized by recurrent episodes of breathlessness, wheezing, coughing, and chest tightness, termed exacerbations. The severity of exacerbations can range from mild to life threatening. Exacerbations can be triggered by exposure to conditions such as: respiratory infections, house dust mites, cockroaches, animal dander, mold, pollen, cold air, exercise, stress, tobacco smoke and indoor and outdoor air pollutants. Using medications and reducing exposure to environmental triggers can reduce both the frequency and severity of asthma symptoms.

The District of Columbia consists of 63 square miles. Unique among US cities, the District of Columbia functions as the nation's capital, a state, and a local municipality. According to the 2000 Census, of the approximately 572,039 District residents, 60 percent are Black, 30.8 percent are White, 7.9 percent are Hispanic and 2.8 percent are Asian/Pacific Islander. With regard to age, 20.1 percent of District residents are under 18 years of age, 67.7 percent are 18 - 64 and 12.2 percent are 65 or more years of age. The District's citizens reside in eight governmental Wards. Local political representation and public service administration is based upon Ward designation. Economic and social status indicators vary considerably across the eight city Wards. For example, median household income varies from $26,300 in Ward 8 to $64,800 in Ward 3. Racial and ethnic composition varies from 6 percent Black non-Hispanic in Ward 3 to 97 percent Black non-Hispanic in Ward 7. More than 40 percent of the Hispanic population is concentrated in Ward 1, and it represents 24 percent of the residents. The Wards contain approximately the same total number of people: Ward 2 has the greater number of persons (82,845) and Ward 8 has the smallest number (61,532).

The District of Columbia has one of the nation's highest asthma rates. Asthma affects District residents of all ages, races and ethnic groups. Recent studies indicate that most children in low-income and minority populations are severely impacted by this chronic disorder. In addition, asthma remains a common problem in adults. While many adult asthmatics have a history of asthma during early childhood, some adults develop asthma due to occupational/workplace related exposures to allergens. There is no readily available data to determine the rate of occupational-related asthma in the District of Columbia.

According to the Centers for Disease Control and Prevention, an estimated 6 percent of the District's residents have asthma. About one-third (10,000) of the 31,700 District asthmatics are under 18 years of age. According to a study conducted by the National Institutes of Health's National Institute of Allergy and Infections Diseases, researchers found that exposure to hazardous environmental substances, high levels of poverty, and the lack of health care are some of the most preventable contributing factors to asthma. These findings mirror what we already know about the District of Columbia's asthma situation. Asthma is more strongly evidenced in those geographic areas of the city with high concentrations of poverty, poor health outcomes, and environmental risks. Asthma-related hospital discharge data mapped by zip code reveals dramatic disparities. For example, zip codes 20032, 20020, and 20019 have the highest incidence of discharges due to asthma than any other zip codes in the District. These zip codes represent Wards 6, 7, and 8— home to many of the District's poorest and most vulnerable

residents. It is in these communities where diagnosis of the disease occurs at a later and often more severe stage.

The District of Columbia currently utilizes three major data sets to determine the prevalence of asthma: the Behavioral Risk Factor Surveillance System (BRFSS); Inpatient Hospital Discharge Data; and the District of Columbia Mortality files.

Ongoing preventive management is needed for patients with persistent asthma, even when mild. Learning how to manage this chronic disease is a major challenge for patients and their families, as well as health care providers and others involved in asthma care. Asthma represents a broad multidimensional chronic health problem that requires a multidisciplinary approach to understanding and addressing its many consequences.

District of Columbia Control Asthma Now Project

In 2001, the District of Columbia was one of 22 states awarded a grant from the Centers for Disease Control and Prevention to develop an infrastructure addressing the burden of asthma. The District of Columbia Department of Health Maternal and Family Health Administration spearhead its **DC CAN C**ontrol **A**sthma **N**ow Project.

The mission of the **DC CAN** Project is to develop a viable, comprehensive, community-based, consumer-centered strategic approach to address the District's asthma epidemic, improve health outcomes, and reduce the burden of asthma in the District. The purpose of this asthma initiative is to engage individuals, communities and public entities in promoting improved asthma prevention strategies, diagnosis and management of this chronic disease by examining environmental exposures, the effects of poverty, and the impact of policy change. This mission will be accomplished through:

1. The development of primary, secondary and tertiary asthma control strategies designed to reduce morbidity among people with asthma.

2. The development of a surveillance system capable of collecting, integrating, analyzing, and disseminating real time data on the prevalence of asthma in the District of Columbia for policy change.

3. The assurance and reshaping of medical care services and effective treatment modalities for asthmatics regardless of ethnic background or economic status.

4. The development of collaborations to include community agencies outside traditional hospital or clinic systems, such as schools, day care centers, public housing developments, senior citizen programs and recreation facilities are included in partnership efforts.

5. The development of asthma educational material for health care providers, patients and the general population, based on research, evidence-based tools and methodologies.

6. The use of the National Asthma Education and Prevention Program (NAEPP) Guidelines and/or performance standards for the care, prevention and management of asthma by health care professionals and institutions.

This report constitutes an important effort for the project that will enable the Department of Health to measure the burden of asthma in the District of Columbia and develop effective strategies for control.

KEY FINDINGS
FOR THE DISTRICT OF COLUMBIA

- In 2002, in the District of Columbia, the lifetime prevalence of asthma was 14.2% compared to11.8% for the United States
- Current asthma prevalence in 2002 in the District of Columbia is 9.1%, which is a 13% increase since 2000 and higher than the national rate of 7.5%.
- For the three (3) year period, 1999-2001, females had a higher current asthma rate (9.5%) than males (4.9%) in the District of Columbia.
- In 2002 in the District of Columbia, the highest prevalence rates for current asthma were among Blacks and females.
- For the three (3) year period, 1999-2001, residents 18-24 suffered with asthma more than other age groups.
- In 2002, the 35-44 age group had the highest prevalence of current asthma (10.9%) followed closely by persons 65 and older (9.6%).
- For the three (3) year period 1999-2001, the prevalence of current asthma was higher among District residents with lower incomes and residents with less than a high school education.
- The prevalence of current asthma in the District of Columbia increased 29% over the previous three (3) year period in the highest income group (>$50,000).
- For the four (4) year period 1998-2001, hospitalization data for asthma indicated that Blacks, Females, and Hispanics had a high rate of asthma.
- Higher rates of hospital discharges due to asthma in the District of Columbia occurred in the youngest age group (0-4) during the four (4) year period 1998-2001.
- The District had a higher death rate due to asthma than the nation in 2000; 1.7 per 100,000 for the District of Columbia compared to 1.6 per 100,000 for the nation.
- The mortality rate per 100,000 population was highest in the District Wards 6, 7, and 8 for the six (6) year period 1995-2000.
- Older residents (55+) are more likely to die from asthma in the District than their younger counterparts (6.3% per 100,000 for the 55+ age group vs. 1.0% per 100,000 for the 0-4 age group) as found in the six (6) year period 1995-2000.

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Asthma is a chronic inflammatory lung disease characterized by recurrent episodes of breathlessness, wheezing, coughing, and chest tightness, termed exacerbations. The severity of exacerbations can range from mild to life threatening. Exacerbations can be triggered by exposure and conditions such as: respiratory infections, dust mites, cockroaches, animal dander, mold, pollen, cold air, exercise, stress, tobacco smoke and indoor and outdoor air pollutants. Using medications and reducing exposure to environmental triggers can reduce both the frequency and severity of asthma symptoms.

Asthma is a key component of the National Healthy People 2010 objectives. Eight objectives address asthma: 24-1 Reduce asthma deaths; 24-2 Reduce asthma hospitalizations; 24-3 Reduce hospital emergency department visits for asthma; 24-4 Reduce activity limitations among persons with asthma; 24-5 Reduce the number of school or work days missed by persons with asthma because of their asthma; 24-6 Increase the proportion of persons with asthma who receive formal patient education, including information regarding community and self-help resources, as an essential part of the management of their condition; 24-7 Increase the proportion of persons with asthma who receive appropriate asthma care according to the National Asthma Education and Prevention Program guidelines; and 24-8 Establish in $\geq$25 states a surveillance system for tracking asthma deaths, illnesses, disabilities, impact of occupational and environmental factors on asthma, access to medical care, and asthma management.

The District of Columbia has established three Healthy People 2010 Objectives for Asthma, which are consistent with the National 2010 Objectives. The District of Columbia will focus on the following three areas: 1) Reduction in asthma mortality rate (24-1); 2) Reduction in overall asthma morbidity, as measured by a reduction in asthma hospitalization rate (24-2); and 3) Reduction in asthma morbidity as measured by a reduction in visits to the Emergency Department (24-3). The other 2010 objectives may be adopted in the future.

Asthma is a growing health problem throughout the United States. According to the Centers for Disease Control 2002 *Trends in Asthma Morbidity and Mortality Report,* an estimated 24.7 million people have been diagnosed with asthma. National statistics indicate that in 2000, asthma accounted for 4,487 deaths, approximately 465,000 hospitalizations, an estimated 1.8 million emergency department (ED) visits, and approximately 10.4 million physician office visits among persons of all ages.

According to the Centers for Disease Control and Prevention (CDC), an estimated six (6) percent of all District residents have asthma. About one-third (10,000) of the 31,700 District persons with asthma are under 18 years of age. According to a study conducted by the National Institutes of Health's National Institute of Allergy and Infections Diseases, researchers found that exposure to hazardous environmental substances, high levels of poverty, and deficits in existing health care services are some of the most preventable contributing factors to asthma.

These findings mirror what we already know about the District of Columbia. In the District of Columbia, people who live in the economically disadvantaged areas are more likely to be exposed to environmental triggers and experience poor heath outcomes.

Like most other states and urban areas, the District of Columbia does not have a comprehensive management information system for integrating data on asthma. Compiling data sources in a comprehensive system would serve to ensure critical insight into drafting strategies and developing effective best practices for asthma control. The District's capacity to synthesize, analyze and interpret data on asthma is limited by the existing infrastructure. The District's logistical difficulties in asthma surveillance include: the lack of consistent definition of asthma in data collection; existing data bases not designed for disease surveillance; and the high cost for developing a comprehensive surveillance system.

In 1998, the Council of State and Territorial Epidemiologists approved a surveillance case definition, which differentiates cases into suspected, probable, and confirmed on the basis of the likelihood that an identified case is truly asthma. Data in this report follows this definition. The mortality and hospitalization classification defines probable cases as death certificates or hospital records listing the asthma diagnostic code (ICD-9 Code: 493; or ICD-10 Codes: J45, J46) as the underlying cause of death or primary diagnosis. Future reports developed from the active surveillance system will contain confirmed and suspected cases.

According to an article in the Journal of Asthma entitled *The Public Health Surveillance of Asthma* (2001), epidemiological surveillance has been described as:

> "the ongoing systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The final link in the surveillance chain is the application of these data to prevention and control. A surveillance system includes a functional capacity for data collection, analysis, and dissemination linked to public health programs."

Efforts have been made to standardize the questionnaires and methods for asthma surveillance:

- The *International Study of Asthma and Allergy in Childhood* was designed to compare asthma rates and potential risk factors across countries and regions of the world.

- The National Center for Health Statistics, Centers for Disease Control and Prevention, designed questions for use in the National Health Information Survey and National Health and Nutrition Examination Survey.

According to the Centers for Disease Control and Prevention, surveillance is a critical public health component essential to addressing asthma. Therefore in 2001, the District of Columbia Department of Health and the Centers for Disease Control and Prevention entered into a

cooperative agreement. The development of an asthma surveillance system is one of the key components of that agreement.

An asthma surveillance system should be based upon sound principles and include data from core asthma surveillance activities such as hospital discharge, mortality, Behavioral Risk Factor Surveillance System, Managed Care utilization, and emergency department surveillance. In addition, effective data analysis methodology should include sample size considerations, age adjustment rates, gender adjustment rates, race and ethnic groupings, and commonly used demographic groupings. A surveillance system should test for validity, reliability, completeness, and its ability to disseminate findings to the wider community.

To address asthma in the District of Columbia, the following questions will be posed and analyzed by age, sex, race/ethnicity, time, and geographic distribution:

- What is the prevalence of asthma in the District of Columbia?
- How severe is asthma for District of Columbia residents?
- How well are individuals living with asthma in the District of Columbia controlling their attacks?
- What is the cost of asthma to District of Columbia residents?

Another key component of the Cooperative Agreement between the Department of Health and the Centers for Disease Control and Prevention is to establish an Asthma Collaborative. The purpose of the Asthma Collaborative is to address the goals of the Cooperative Agreement, which are to:

- Establish a District-wide planning process with key community stakeholders to guide the development of the District of Columbia Strategic Asthma Plan through collaborative partnership.
- Develop an asthma surveillance system to guide efforts and monitor progress; and
- Implement activities addressed in the Strategic Asthma Plan.

The achievement of these three identified goals will result in a significant decrease in the burden of asthma in the District of Columbia. The Asthma Statistical Report and the District of Columbia Strategic Asthma Plan will be disseminated to consumers, providers and the public at large.

Expected outcomes include:

<u>Patients and the Public</u>

- Increased public awareness of asthma as a significant public health problem.
- Increased public awareness of the signs and symptoms of asthma.
- Improved knowledge, attitudes, and skills of patients regarding the early detection, treatment and control of asthma, particularly in high-risk, diverse populations.
- Defined guidelines for effective asthma education programs.

- Increased development, promotion, dissemination, and use of patient and family education materials.

Health Professionals

- Increased knowledge, attitudes, and skills of all health professionals regarding signs, symptoms, and management strategies for asthma.
- Improved treatment of asthma patients by health professionals to track and monitor patient status.
- Increased number of providers who develop asthma plans with patients and their families.
- Increased number of providers encouraging patient involvement in health decision-making.
- Developed resource materials for use by health care providers.

The effects of asthma on the District's population requires a public health response that embraces a multidisciplinary community perspective, designed to increase the management of the condition. The **DC CAN** Project is therefore addressing the asthma burden through public and private partnerships, driven in part, by this statistical report.

ABOUT THE DATA

This document is the first comprehensive compilation of data on asthma in the District of Columbia.

The report is organized into three major sections, utilizing the following data sources:

1. The District of Columbia Behavior Risk Factor Surveillance System (BRFSS)
2. District of Columbia Hospital Association Inpatient Hospital Data File
3. Emergency Department data from seven (8) District hospitals
4. The District of Columbia State Center for Health Statistics Mortality data file

Findings gathered from the analysis of these data will be utilized to:

1. Provide baseline data for the development of outcome-based strategies for the District of Columbia Strategic Asthma Plan;
2. Inform the public about asthma in the District of Columbia;
3. Guide program planning; and
4. Determine gaps in the current data sources, and identify new information to be collected.

CHAPTER 1
BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM

In 1984, the Centers for Disease Control and Prevention (CDC) and state health departments established a data collection system called the Behavioral Risk Factor Surveillance System (BRFSS) (www.cdc.gov/brfss). Considered the world's largest random digit dialing telephone health survey of adults (18 and older), the BFRSS tracks health risk behavior in an effort to improve health in the United States. The BRFSS is a cross-sectional surveillance questionnaire involving 52 reporting areas. A core set of questions was developed to collect and compare data across states. Data from the BRFSS is useful for planning, initiating, supporting, and evaluating health promotion and disease prevention programs.

Assessment questions regarding asthma in the District of Columbia's BRFSS were included over a 4 year period (1999-2002). The number of participants in the District of Columbia BRFSS has increased 52% from 1,258 total respondents in 1999 to 2,405 total respondents in 2002.

The two core questions included in the asthma module of the survey are:

A. Has a doctor ever told you that you have asthma? and
B. Do you still have asthma?

Using the responses from these questions, two definitions for asthma were constructed:

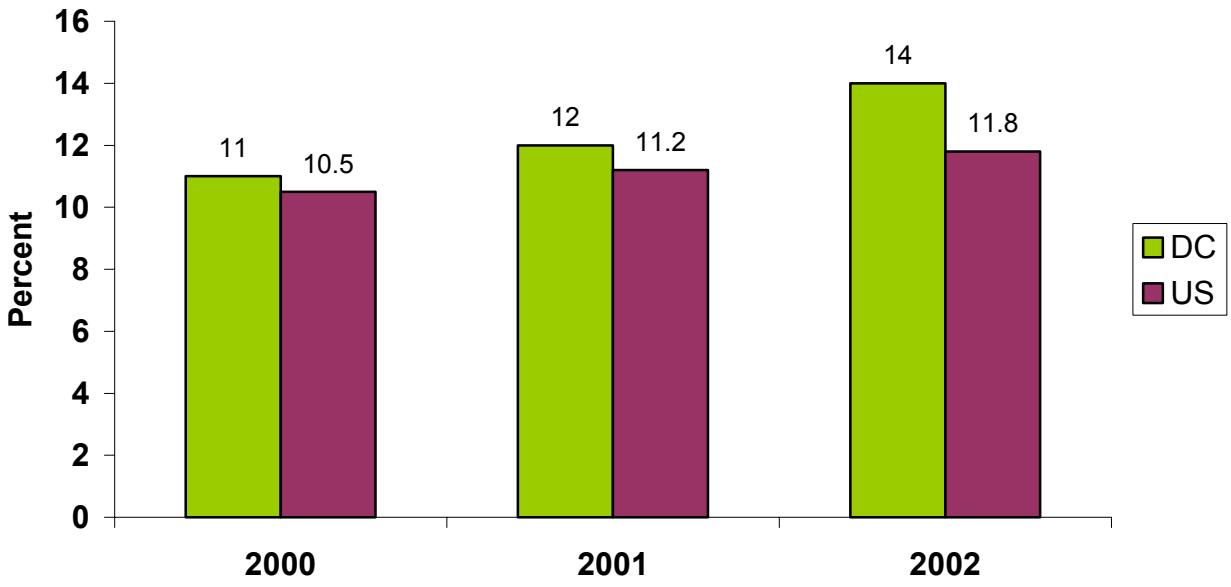
- "**Lifetime**" asthma prevalence is defined as the number of respondents answering "Yes" to question A divided by the total number of respondents (age 18 years and older), to the survey.

- "**Current**" asthma prevalence is defined as the number of respondents answering "Yes" to question B divided by the total number of respondents (age 18 years and older), to the survey.

Prevalence percentages are weighted to population statistics. The number of survey respondents per region is a sample of the total population for that region. Responses are calculated as if everyone in the region was able to contribute to the survey. The weighting schema can be found in the BRFSS technical literature.

The District of Columbia Department of Health Bureau of Epidemiology and Health Risk Assessment (BEHRA) performed the statistical analysis for Figures 1.3 through Figure 1.8. BEHRA provided prevalence percentages weighted to the population characteristics using SUDAAN software. The years 1999-2001 were aggregated to increase the total sample size.

Figure 1.1 **Prevalence of Lifetime Adult Asthma**
CDC BRFSS, 2000-2002

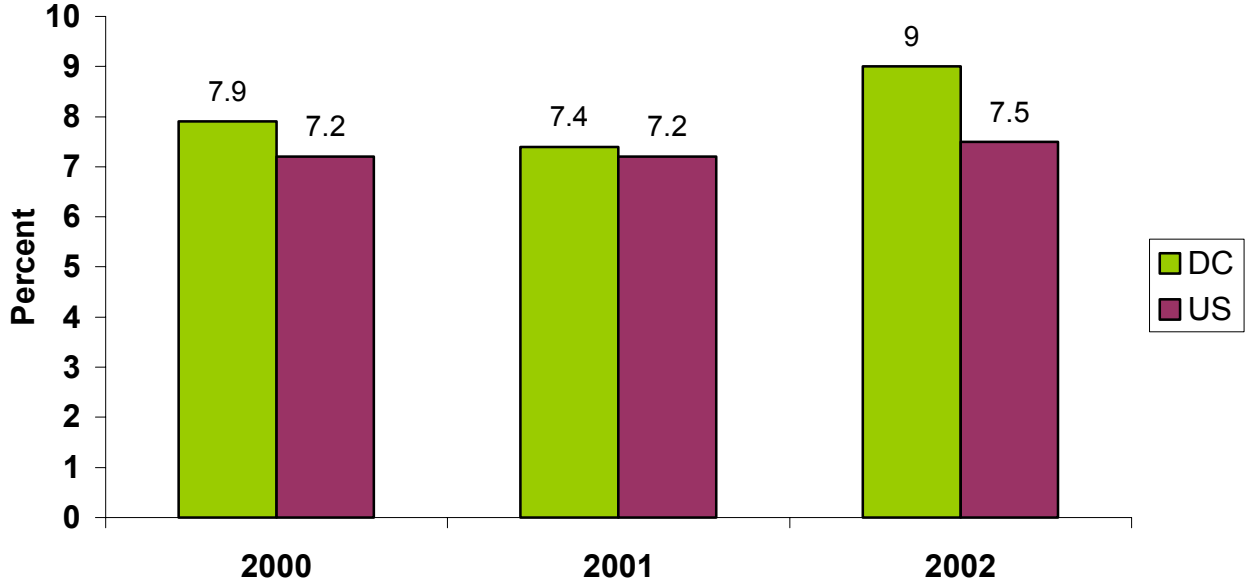


Note: US total includes the 50 states and the District of Columbia
% = Weighted prevalence

The District of Columbia has a lifetime adult asthma prevalence rate slightly higher than the nation. It is interesting to note that the prevalence has been increasing over the years (Figure 1.1): 11% in Year 2000, 12% in Year 2001 and 14% in Year 2002.

States that border the District were reviewed for lifetime prevalence. Lifetime prevalence rate in 2002 in Maryland was 12.7% while in Virginia for the same year the rate was 12.1%. These rates are similar to the District of Columbia in that they are higher than the national rate.

Figure 1.2 **Prevalence of Current Adult Asthma**
CDC BRFSS, 2000-2002

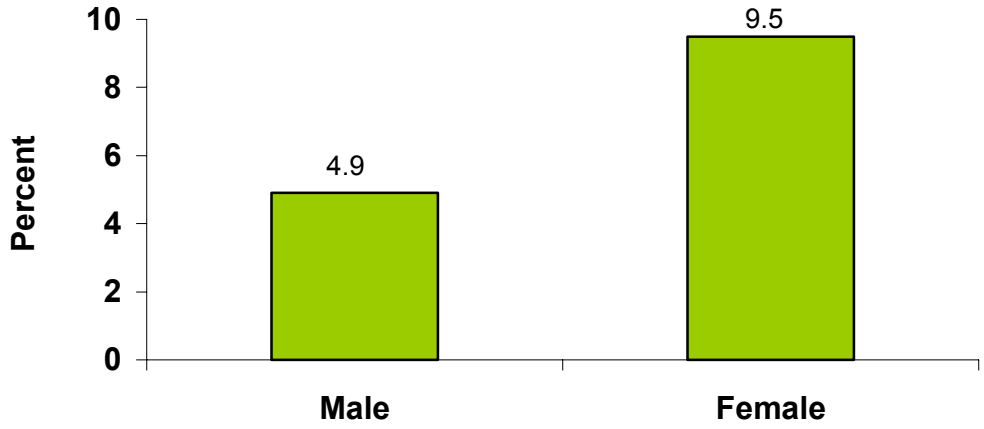


Note: US total includes the 50 states and the District of Columbia
% = Weighted prevalence

Current asthma prevalence in the District of Columbia has remained greater than the national rate over the three year period (Figure 1.2). There was a slight decline from 2000 to 2001 but sharply increased in 2002.

States that border the District were compared for current asthma prevalence. In 2002 current asthma prevalence in Maryland was 8.2% while in Virginia the rate was 7.2%. Maryland has a greater rate then the nation, while Virginia is close to the national value.

Figure 1.3 **Prevalence of Current Adult Asthma by Gender**
District of Columbia BRFSS, 1999-2001

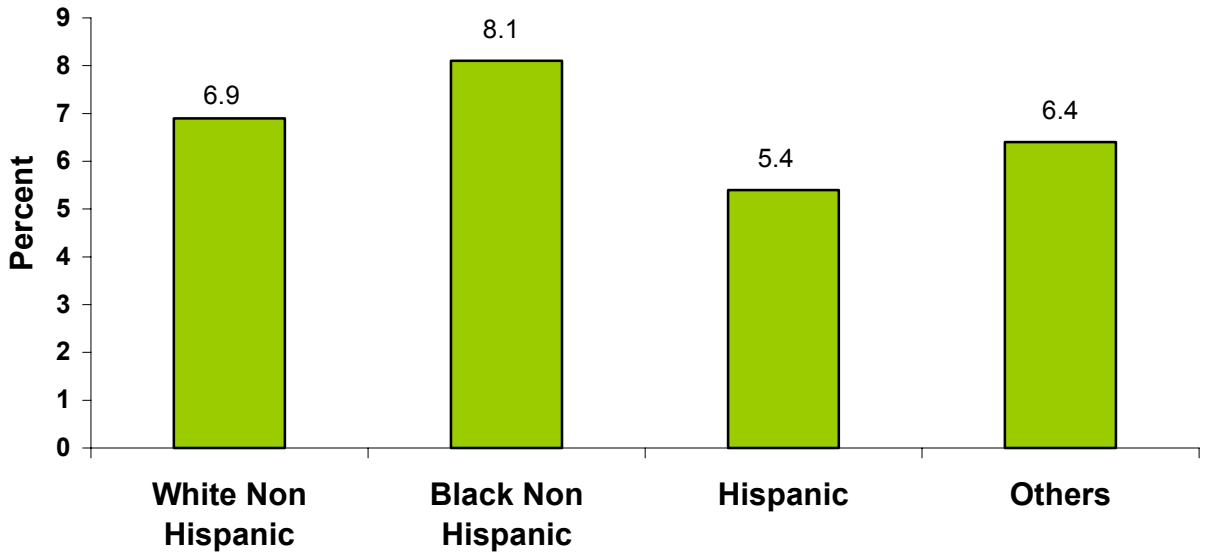


Note: % = Weighted prevalence

When looking at current asthma by gender for the three-year period (Figure 1.3), women were found to have a prevalence rate almost two times greater than men. In the 2000 District of Columbia Census, 53% of all residents were female and 47% were male.

Current asthma prevalence in the 2002 District of Columbia BRFSS shows little change in female prevalence (10.3%) but shows a large difference in male prevalence (7.5%). National comparisons for the same year are not available at the time of publication.

Figure 1.4 **Prevalence of Current Adult Asthma by Race**
District of Columbia BRFSS, 1999-2001

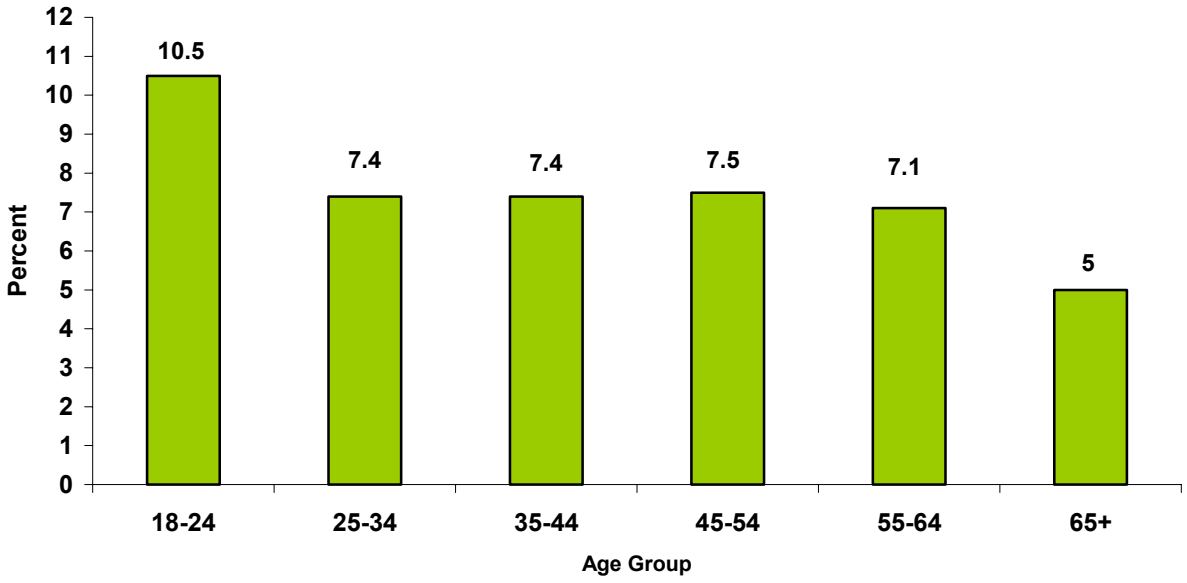


Note: % = Weighted prevalence

For the three-year reporting period (Figure 1.4), Black Non-Hispanics had the highest prevalence of current asthma (8.1%), followed by White Non-Hispanics (6.9%). The 2000 District of Columbia Census indicates that 60% of all residents are Black, 31% White, 7.9% Hispanic and 2.7% Asian.

Current asthma prevalence in the 2002 District of Columbia BRFSS has increased over all race/ethnic groups. However, an increase in the Hispanic prevalence rate is most notable (12.5%). National comparisons for the same year are not available at the time of publication.

Figure 1.5 Prevalence of Current Adult Asthma by Age Group District of Columbia BRFSS, 1999-2001

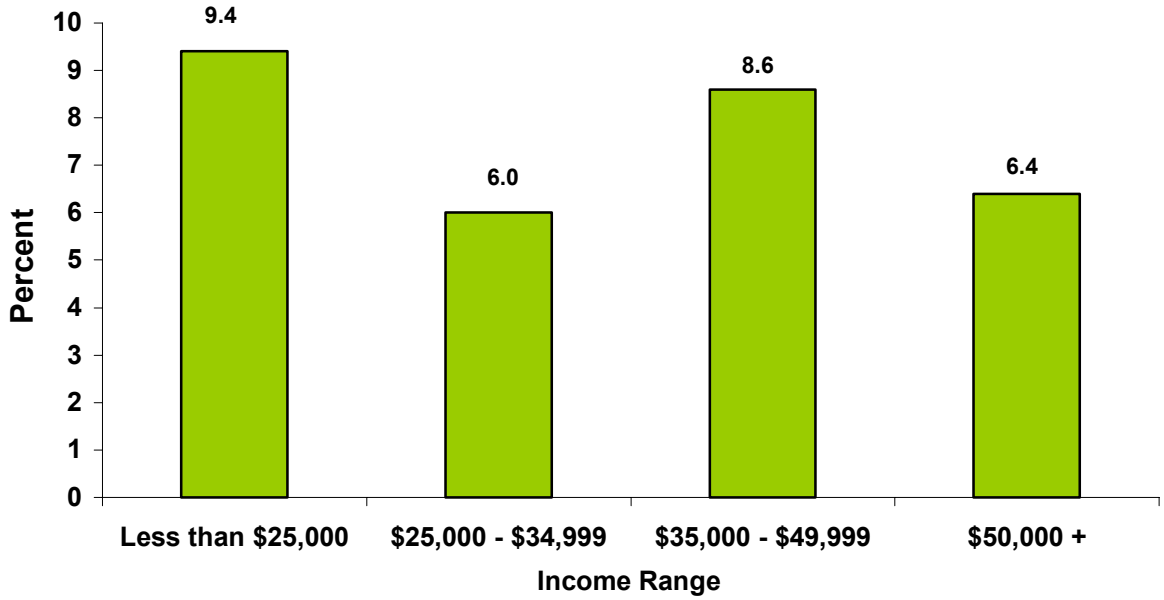


Note: % = Weighted prevalence

Current asthma prevalence for the three-year reporting period was highest among the 18-24 year age group (Figure 1.5). The 2000 District of Columbia Census reports that 80% of the District's population is over 18 years of age and 12% of the population is 65 or over.

In the 2002 District of Columbia BRFSS, current asthma prevalence increased for all age groups except 18-24 (10.0%). The prevalence in the 35-44 age group increased to 10.9%, and the 65 and older age group increased to 9.6%. National comparisons for the same year are not available at the time of publication.

Figure 1.6 Prevalence of Current Adult Asthma by Income Range
District of Columbia BRFSS, 1999-2001



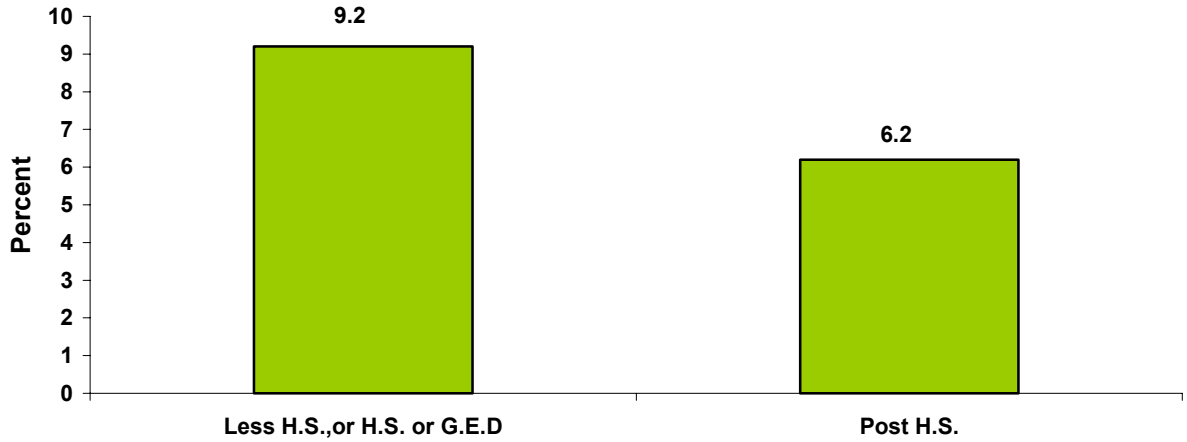
Note: % = Weighted prevalence

For the three-year reporting period 1999-2001, persons with an annual household income of less than $25,000 have the highest current asthma prevalence (Figure 1.6). The highest prevalence is in the lowest income group. No conclusion is drawn on the association between asthma and income level due to the fluctuation among the income ranges.

Current asthma prevalence in the 2002 District of Columbia BRFSS, showed the greatest increase in the highest income level, the $50,000 and over group (9.0%). National comparisons for the same year are not available at the time of publication.

Median household income reported in the 2000 District of Columbia Census was $41,000, which is slightly higher than the 1999 reported income of $40,127.

Figure 1.7 Prevalence of Current Adult Asthma by Education Level District of Columbia BRFSS, 1999-2001

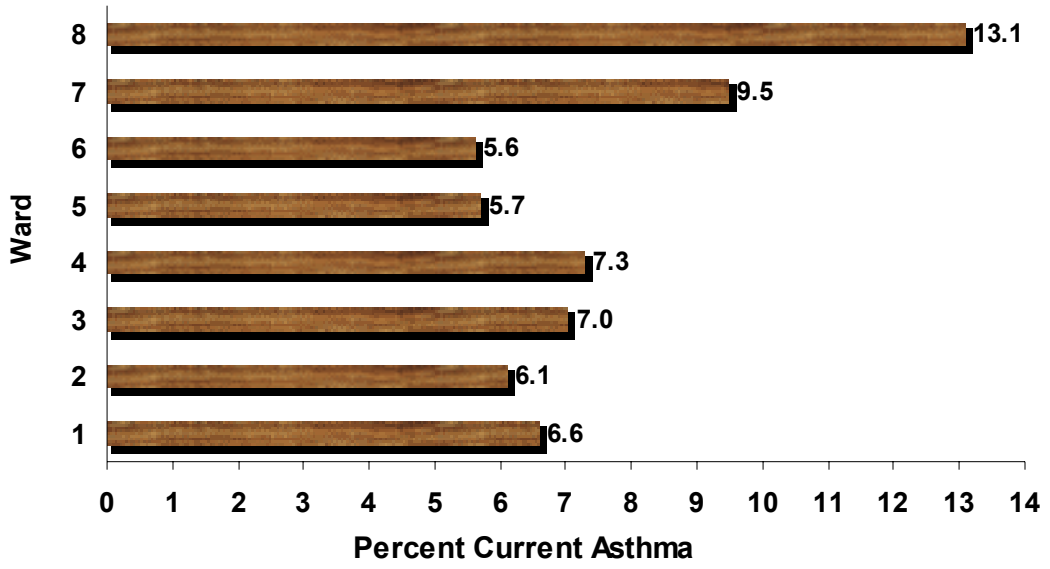


Note: % = Weighted prevalence
*Less HS = Less than High School Education; HS=High School; GED = General Education Diploma;
Post HS = Post High School and College Graduate or Higher

In Figure 1.7 data was aggregated into two groups: persons with less than a High School or GED education; and persons with greater than a High School education. Persons with less than a high school education for the three-year reporting period had higher asthma prevalence than persons with a greater than high school education.

Current asthma prevalence in the 2002 District of Columbia BRFSS increased in both education levels (10.4% for Less than High School and 8.4% for Post High School). National comparisons for the same year are not available at the time of publication.

Figure 1.8 Prevalence of Current Adult Asthma by Ward District of Columbia BRFSS, 1999-2001



Note: % = Weighted prevalence

Current asthma prevalence shown in Figure 1.8 for the three-year reporting period (1999-2001) ranges from a low of 5.6% in Ward 6 to a high of 13.1% in Ward 8.

The prevalence is geographically distributed with the highest levels in Wards 4, 7, and 8. Ward 8 has the younger demographic (37% less than 17 years of age) and lowest median income. Ward 4 has the largest Hispanic population among these three Wards.

In 2002 current asthma prevalence was highest in Ward 8 (12.6%). In 2002, there was an increase in asthma prevalence in Wards 2 (8.7%0, 3 (9.5%), 4 (9.5%), 5 (8.3%) and 6 (8.3%). There was a decrease in Ward 1 (6.7%), and Ward 7 (7.7%). A more complete description of the ward structure can be found in the Introduction.

CHAPTER 2

ASTHMA HOSPTIAL DISCHARGE DATA

According to the CDC's National Center for Health Statistics, there were 465,000 (17 per 10,000 people) asthma hospitalizations in year 2000 in the nation. Among children 0-17 years, there were 214,000 hospitalizations (30 per 10,000 persons). Hospitalizations were highest among children 0-4 years of age, with 67 hospitalizations per 10,000 children. The asthma hospitalization rate for Blacks was nearly twice that of Whites. The hospitalization rate for females was 25% higher than males.

The District of Columbia Hospital Association (DCHA) collects discharge data on hospitals in the District. The discharge data is analyzed by ICD-9-CM code for the years 1998 – 2001, where the primary diagnosis is asthma. The hospital association serves as the conduit through which the Department of Health acquires the inpatient hospital discharge data. These data are submitted from all hospitals, acute care hospitals (average length of stay of fewer than 30 days) and long-term care facilities within the District of Columbia. These data are acquired from the Uniform Billing Form (UB-92) and submitted on an annual basis to the Department of Health.

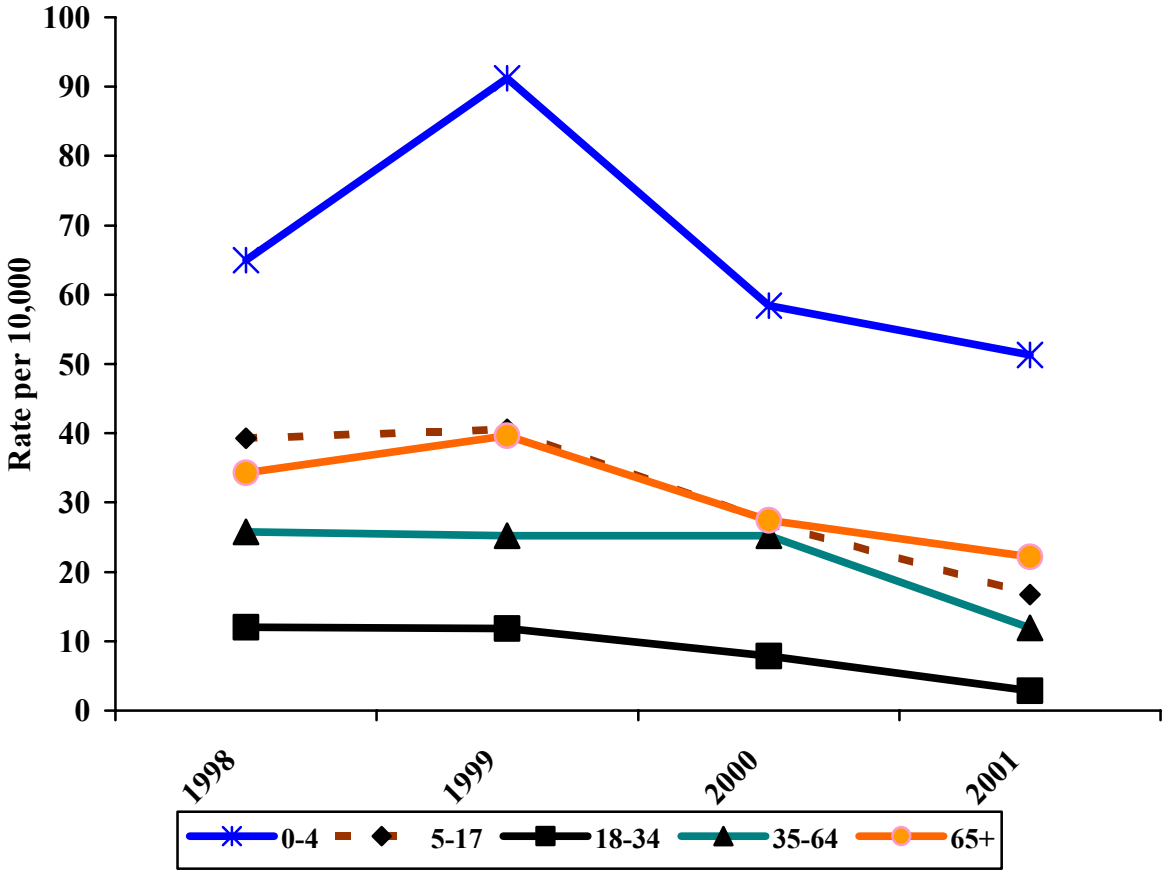
The number of hospital discharges with asthma as the primary diagnosis has decreased from 1998 onward. In 1998 there were 1,406 discharges (a rate of 26.9 per 10,000), while in 2001 the number of discharges had precipitously decreased to 763 (a rate of 13.34 per 10,000). It should be noted that the only aberration in the decreasing trend occurred in 1999 when there were 1,585 discharges (a rate of 30.5 per 10,000). In 2000 the rate of discharge for asthma again declined with 1,279 discharges (a rate of 22.4 per 10,000).

The Department of Health Bureau of Epidemiology and Health Risk Assessment (BEHRA) has been conducting an ongoing syndromic surveillance system on seven (7) syndromes (Death, Sepsis, Rash, Respiratory, Gastrointestinal, Unspecified Infection, and Neurological). The Bureau receives daily emergency department logs from eight (8) hospital emergency departments within the District. This data is coded for the seven (7) syndromes that are used for tracking outbreaks in the District. Daily, weekly, and monthly trends can be tracked, identifying differences in patterns of syndromes and identifying disease outbreaks related to possible Bioterrorism events. Respiratory illness is one of the syndromes, of which asthma is included. In 2004, asthma will be coded as an additional syndrome to facilitate emergency department surveillance.

BEHRA also maintains a list of High Incidence Flag Days among the emergency departments. A Flag represents a higher incidence of a syndrome than normally would be expected. This data was reviewed from September 2002-September 2003 for asthma as the primary diagnosis or chief complaint. A total of 120 emergency department visits were identified: 58 females and 62 males. Children less than 5 years of age accounted for 25% of visits and fewer than 1% were persons over 55 years of age. Persons less than 18 made up 61% of emergency department visits for these high incidence days. It was also

found that the months of February and April were the highest for asthma-related conditions/diagnoses. No association can be drawn between asthma and the environment based on these findings. Further analysis into the association between asthma and the environment should include the asthma incidence during the hotter months when ozone levels are elevated.

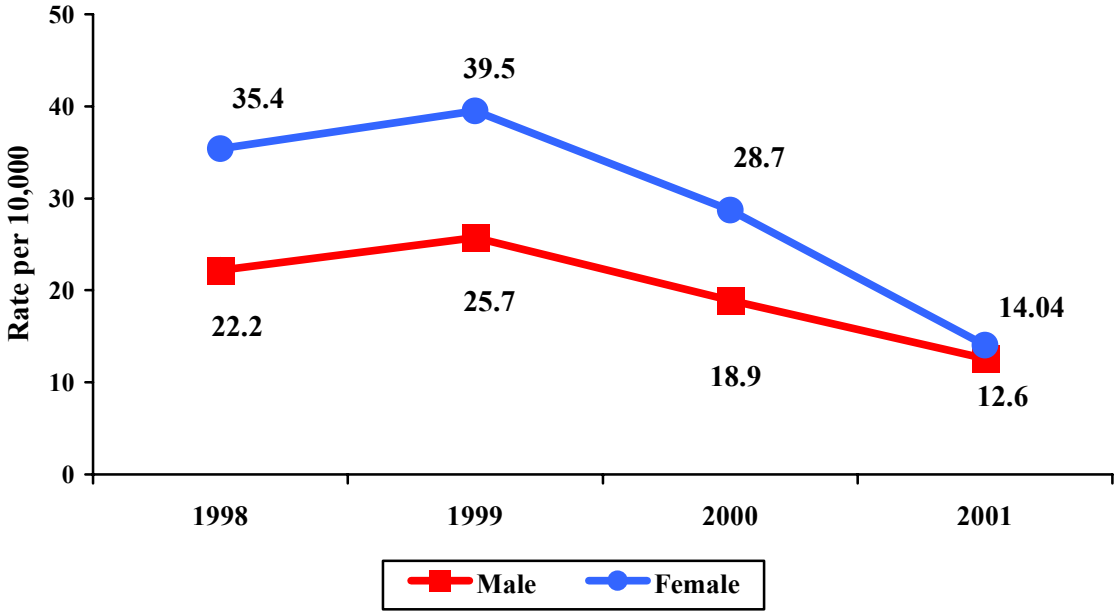
Figure 2.1. Rate of Asthma Inpatient Discharges by Age Group District of Columbia Residents 1998-2001



Note: 2001 rates are based on 2000 population.
Source: District of Columbia Hospital Association Inpatient Database

Hospitalization data includes all age groups, as opposed to BRFSS, which only evaluates persons 18 and older. As seen in Figure 2.1 persons over 65 have a similar discharge rate as those 5-17 years old. Young children (0-4 years) have the highest rate of discharge over the four-year period. It can be noted that in 1999 for this population the rate increased by one-third only to decline below 1998 levels in the subsequent years. This sharp increase was not seen in the other age groups, although the 65 and older age group did show a 14 % increase from 1998 to 1999.

Figure 2.2 **Rate of Asthma Inpatient Discharges by Gender**
District of Columbia Residents
1998-2001

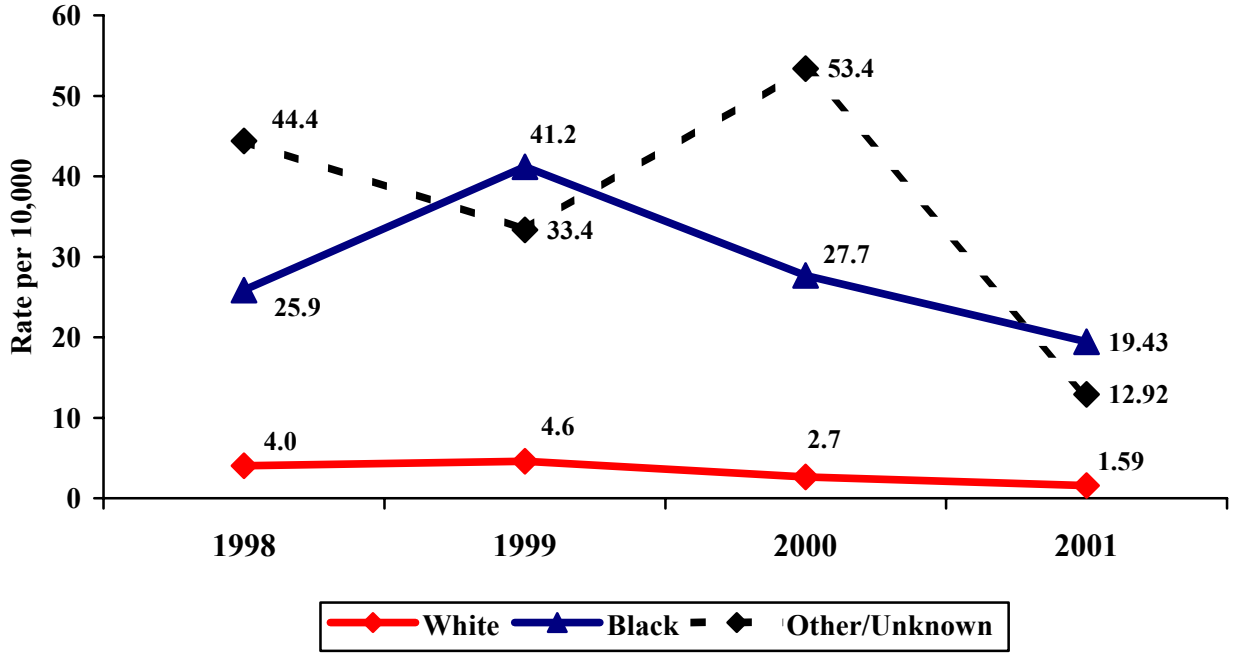


Note: 2001 rates are based on 2000 population.
Source: District of Columbia Hospital Association Inpatient Database

From 1999 to 2001, hospitalization rates have declined. However, as seen in Figure 2.2 above, females have higher hospitalization rates than males. For females, there was a 60.3% decline in rates of hospitalization during the period 1998-2001. For the same period males declined 43%.

Between 1998 and 2000 the gap between the two groups was maintained at greater than 30%. In 1998 females were 37% more likely to be discharged with an asthma diagnosis than males. In 2001 females were 10.3 % more likely to be discharged with an asthma diagnosis than males.

Figure 2.3 Rate of Asthma Inpatient Discharges by Race
District of Columbia Residents
1998-2001

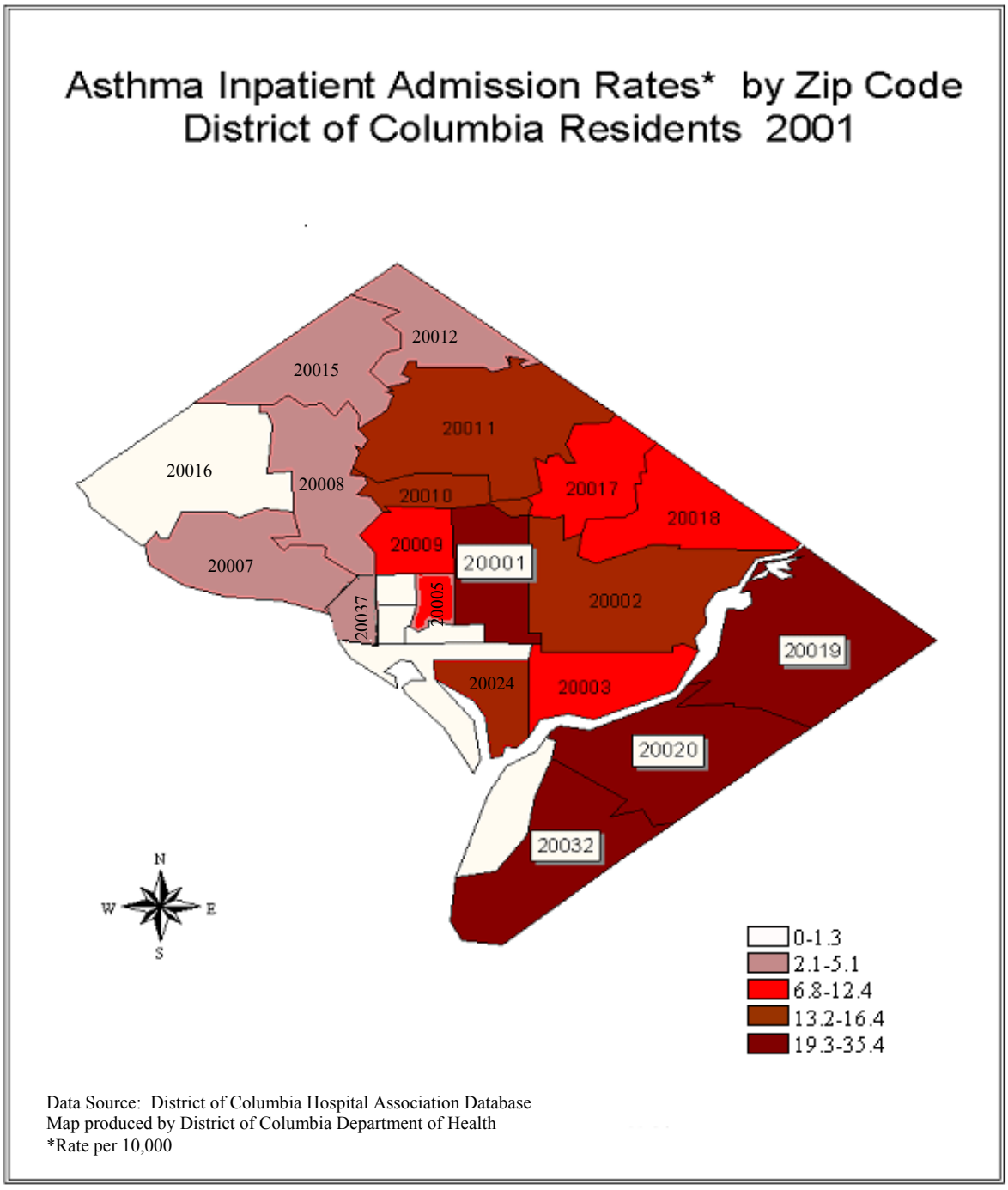


Note: 2001 rates are based on 2000 population.
Other includes: American Indians and Alaskan Natives, Asian & Pacific Islanders, Hispanics and Unknown
Source: District of Columbia Hospital Association Inpatient Database

Figure 2.3 reflects the inpatient hospitalization rate by race. The Other race group has fluctuated over the four-year period reaching a high of 53.4 in 2000 subsequently falling to its lowest level for the year 2001. Similarly, the rate for Blacks peaked in 1999 but showed a steady decrease in 2000 and 2001. The trend for the White group has remained stable over the period.

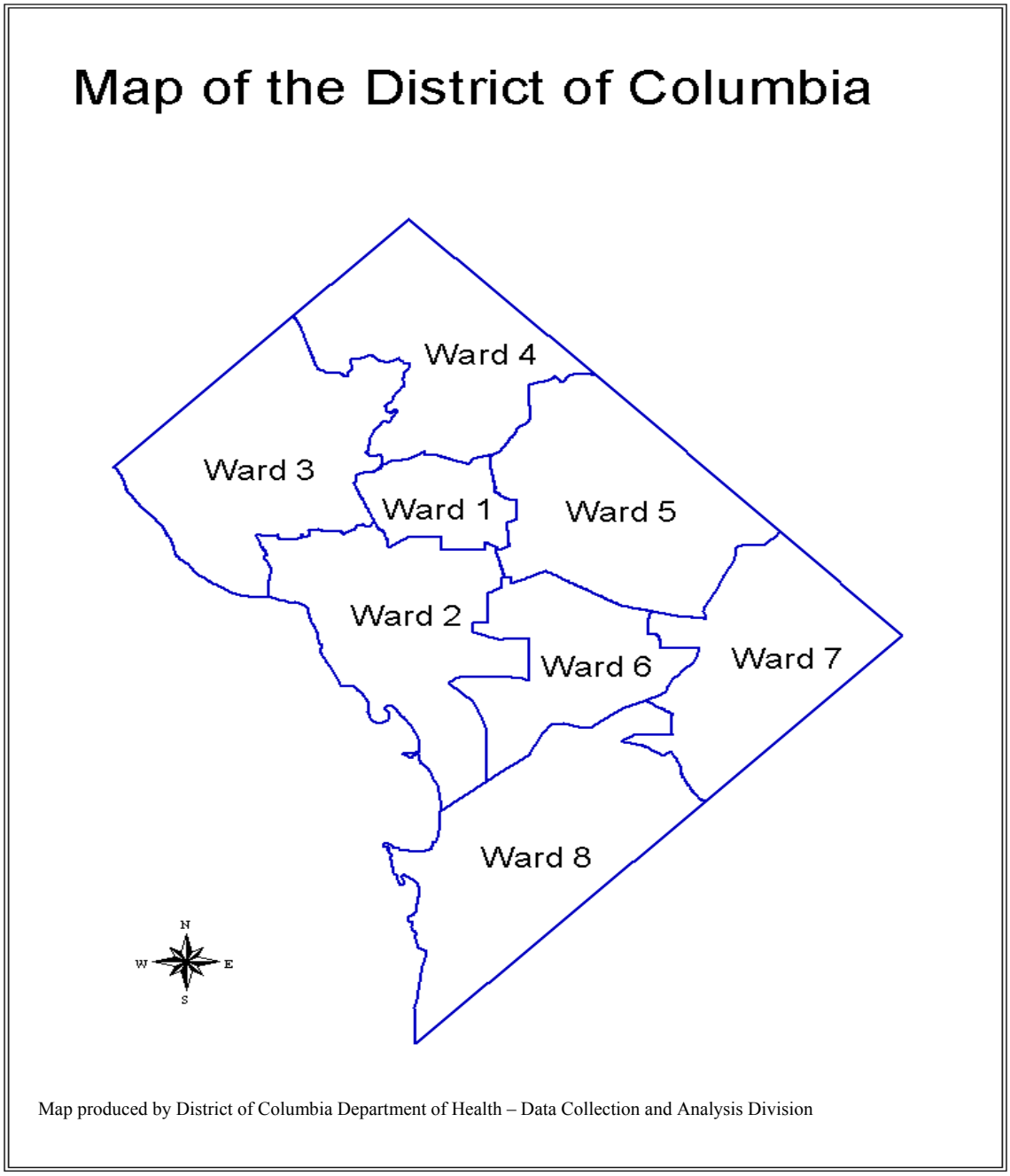
Data for the other category is not available by individual race groups. The Other category includes American Indians and Alaskan Natives, Asian & Pacific Islanders, Hispanics and Unknowns.

Figure 2.4



As can be seen in Figure 2.4, the highest incidence of hospitalizations in 2001 occurred in zip codes 20001, 20019, 20020, and 20032, which does not differ from year 2000 statistics. Zip codes 20019, 20020, and 20032 are located in Wards 7 and 8, which have the lowest socioeconomic indicators in the city.

Figure 2.5 Ward Map



The hospital discharge data file does not contain complete addresses, and zip codes may overlap Wards in some instances. Therefore zip codes cannot be easily separated into Wards. A Ward map is provided (Figure 2.5) for a clearer understanding of the relationship between the two.

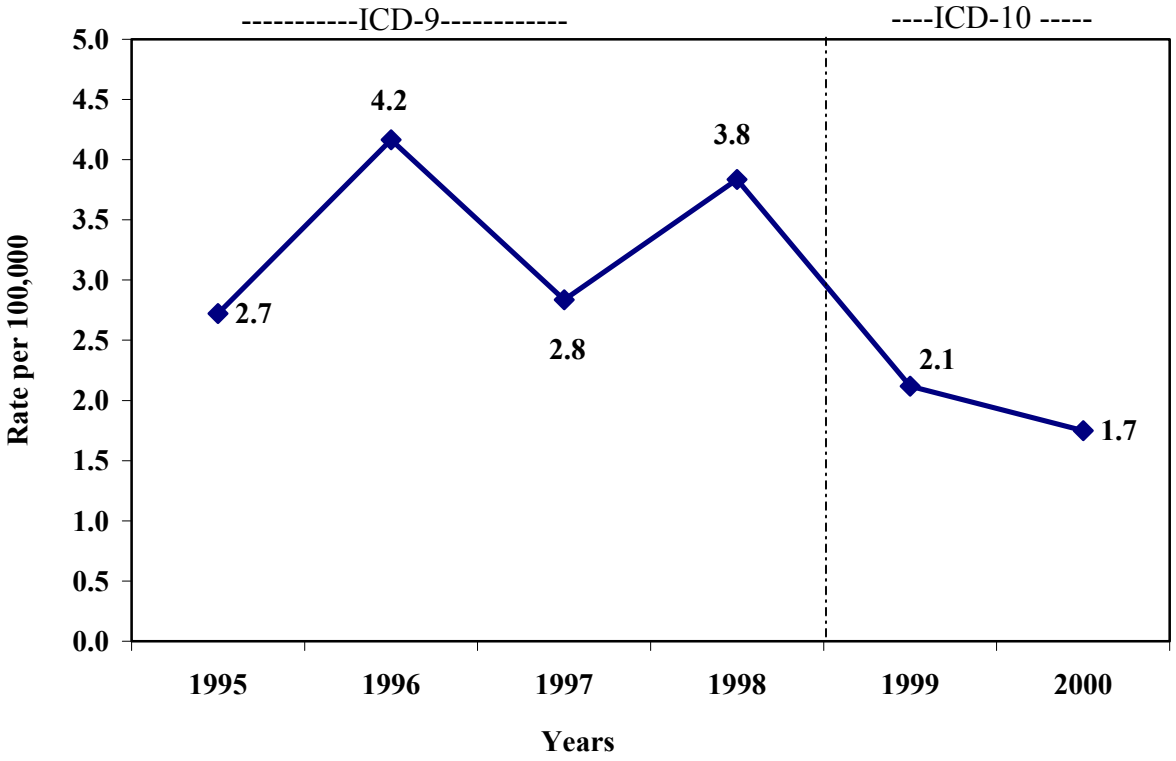
CHAPTER 3
ASTHMA MORTALITY RATES

According to the CDC's National Center for Health Statistics, the national asthma death rate in 2000 was 1.6 per 100,000 persons. In the same year in the District of Columbia the mortality rate was 1.7 per 100,000 persons. Asthma deaths are highest among persons over 85 and rare among children. Nationally, for the year 2000, children aged 0-17 years died from asthma at a rate of 0.3 deaths per 100,000 compared to 2.1 deaths per 100,000 adults (ages 18 years and older).

Also in 2000, the national asthma rate in the Black population (3.9 per 100,000 persons) was three times the rate in the White population (1.3 per 100,000). The rate for Hispanics was 1.5 per 100,000, which is 63% lower than non-Hispanic Blacks, but 15% higher than non-Hispanic Whites. Black women had the highest mortality rate due to asthma in 2000 (4.2 per 100,000). In 2000, women (1.8 per 100,000) had an asthma death rate about 40% higher than men (1.3 per 100,000).

For a review of mortality data over time, the District of Columbia State Center for Health Statistics Administration provided asthma data from 1995-1998 using ICD-9-CM code 493 and data from 1999-2000 using ICD-10 code J45 and J46 (primary cause of death).

Figure 3.1 Asthma Mortality Rate per 100,000 District of Columbia 1995-2000

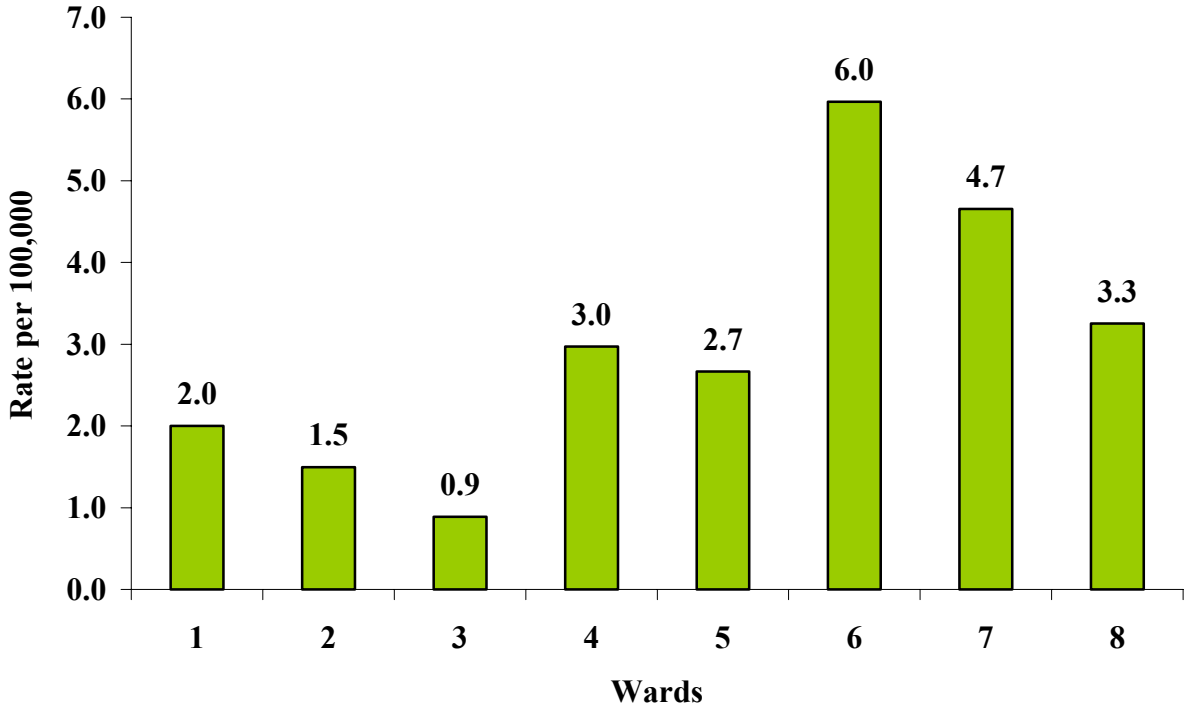


Source: District of Columbia State Center for Health Statistics Administration

In the District of Columbia, deaths from asthma have slowly decreased from 1998 (Figure 3.1). In 1999 the International Classification of Disease tenth revision (ICD-10) replaced the International Classification of Disease ninth revision (ICD-9-CM) for mortality coding. This change in ICD 9 coding results in a 10% less likelihood that deaths due to asthma are coded as asthma and does not affect the trend in Figure 3.1.

The mortality rate has fluctuated from 1995 to 1998, after which there was a precipitous and sustained decline through the year 2000. Although the rates have not followed a steady trend for the time period, the number of deaths in the District due to asthma is very small. The peaks do not represent a large number of deaths.

Figure 3.2 Asthma Mortality Rate per 100,000 by Ward
District of Columbia
1995-2000



Source: District of Columbia State Center for Health Statistics Administration

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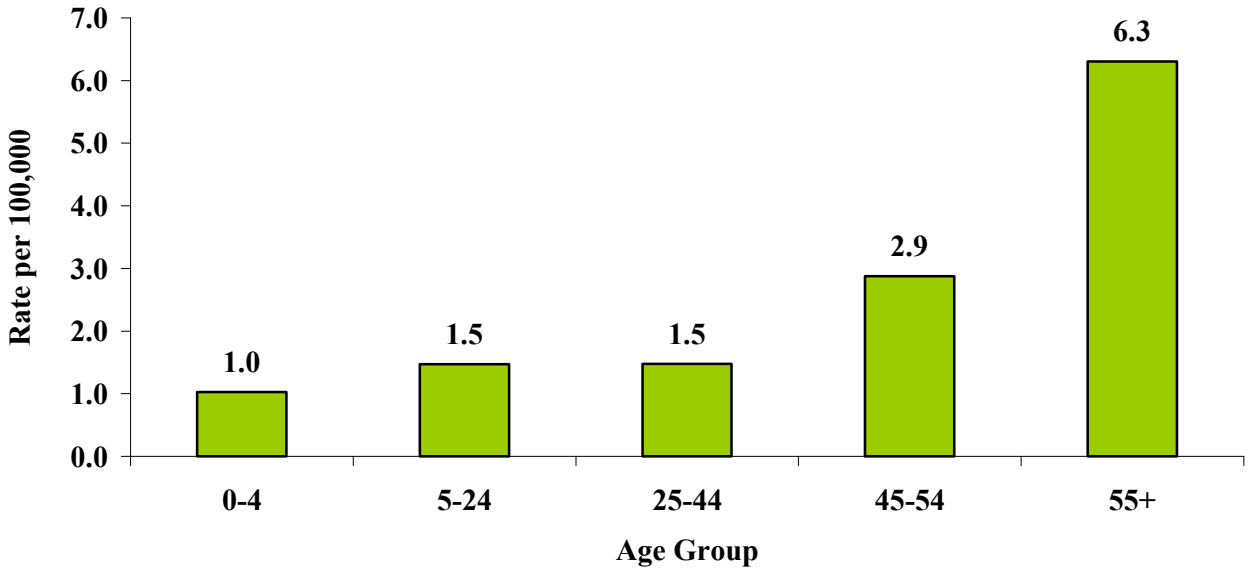
Figure 3.2 shows that Wards 6, 7, and 8 have the highest mortality rates. Asthma mortality analyzed by Ward for the six-year reporting period 1995-2000 reflects the trend seen in the BRFSS and the inpatient discharge data. Wards 7 and 8 contain the population in the lowest socioeconomic strata. Ward 6 contains a larger portion of Asian and Hispanic residents compared to the other two wards.

A more complete description of the ward structure can be found in the Introduction.

Figure 3.3 Asthma Mortality Rate by Age Group
District of Columbia
1995-2000



Source: District of Columbia State Center for Health Statistics Administration

As shown in Figure 3.3, asthma deaths for the combined years 1995-2000 were more prevalent in the oldest age group. Although the BRFSS asthma prevalence rate and the hospital discharge rate is highest in the youngest age group, older residents are more likely to die from asthma or related complications.

CONCLUSIONS

Statistically the District of Columbia has one of the nation's highest asthma prevalence rates based on the Behavioral Risk Factor Surveillance System (BRFSS). Compared to neighboring states, prevalence rates are higher in the District of Columbia than in Maryland and Virginia, and higher than the US in general.

Asthma affects District residents of all ages, races, and ethnic groups. Young children in low-income and minority populations have been most severely impacted by this chronic disorder. However, asthma has been increasing in the adult population.

The prevalence of asthma is highest in minority populations based on the three data sources used in this publication. As seen in BRFSS, the lower income and education levels have higher rates of asthma, but strikingly the higher age group (65+) in year 2002 surpassed all other age groups.

In addition, the young and the elderly suffer the most from asthma as evidenced by the data. Increased hospitalizations and asthma prevalence rates are the hallmark of the younger age group. Not surprisingly, the younger age group dominates the emergency department visits as noted in a non-scientific study. The oldest age group predominantly has the highest mortality rate.

Unfortunately, there is no data to determine the rates of occupational-related asthma in the District of Columbia. Future environmental studies should look deeper into this problem. To determine the impact of asthma in District of Columbia, studies on the economic cost of asthma on the lower income population will be conducted using data from the Medicaid program.

This data lays the framework for future plans outlined by the District to implement programs for persons who are most impacted by asthma. Ongoing preventive management, education, health care provider issues, environmental and occupational issues, and policy planning should all be addressed in the District of Columbia Strategic Asthma Plan. While asthma represents a broad, multifaceted problem it will require a multidisciplinary approach to understand it fully and address its many consequences.

As can be seen by available data sets, the burden of asthma in the District of Columbia is concentrated in the poorest neighborhoods and among the youngest and oldest residents. Despite the availability of these data sets, there is no current integration of data and gaps have been identified. Based on this reports findings, the District of Columbia Asthma Surveillance System is being developed to integrate the various databases available at the Department of Health into one centralized location; i.e. to create an Asthma Data Warehouse.

FUTURE PLANS

In addition to the current asthma data sets, the creation of an Asthma Data Warehouse will enable the Department of Health to integrate other areas of concern such as childhood and workplace asthma data. Further, a partnership with the Department of Health Environmental Health Administration and the Medical Assistance Administration is being developed to integrate environmental surveillance and Medicaid cost data.

The Asthma Data Warehouse will have the added capability for the Department of Health to collect and analyze data on Emergency Department visits, over the counter pharmaceuticals, and school absenteeism. Further, workman's compensation data will be incorporated into the surveillance system to determine the prevalence and impact of occupational-related asthma. In order to develop and provide comprehensive data on asthma in the District of Columbia, additional data sets will need to be collected. Plans for future reports may include:

- Incidence and prevalence rates by months and year;
- Analysis of the economic impact of asthma on primary care services, patient costs, specialty services, Emergency Department services, hospital inpatients, and pharmaceuticals;
- Evaluation of indirect costs as demonstrated by work/income loss due to illness, premature death, and the proportion of asthmatic inpatient cost versus the total hospital admissions;
- Rank of asthma hospitalization vs. all other admissions;
- Analysis of adherence to national and local guidelines on the use of and access to asthma medications; and
- Evaluation of the level of asthma severity and its impact on functioning.

Future plans also include analysis of the Medical Assistance Administration's Medicaid records, and further analysis of the District of Columbia Hospital Association's Inpatient Discharge Data to provide a clearer picture on the cost of asthma in the District. In addition, the District has begun to develop a Medicaid Data Warehouse, which will link Medicaid data with various public health programs.

The data sources utilized for this report have several limitations:

- The BRFSS is a telephone survey and some populations such as the disadvantaged poor may not have access to telephones. A more representative indicator of the burden of asthma in such populations may be Emergency Department or Hospital Inpatient Discharges for asthma.

- There is a growing Spanish speaking population in the District of Columbia. As the BRFSS is currently limited to English-speaking persons, the asthma burden in

this sector of the population may be underreported. In future years, a Spanish language version of the BRFSS may be introduced.

- The BRFSS is a survey of non-institutionalized persons 18 years and older. Thus, prevalence of asthma in children cannot be estimated.

However, gaps in data from the BRFSS will be addressed through the addition of nine questions to the 2002 BRFSS survey. This enables the District of Columbia to capture data similar to that collected by other states. Future questions may be added to specifically capture data on children. The nine additional 2002 BRFSS survey questions, to be analyzed in 2004, are:

1. How old were you when you were first told by a doctor, nurse, or other health professional that you had asthma?
2. During the past 12 months, have you had an episode of asthma or an asthma attack?
3. During the past 12 months, how many times did you visit an emergency room or urgent care center because of your asthma?
4. During the past 12 months, how many times did you see a doctor, nurse or other health professional for urgent treatment of worsening asthma symptoms?
5. During the past 12 months, how many times did you see a doctor, nurse, or other health professional for a routine checkup for your asthma?
6. During the past 12 months, how many days were you unable to work or carry out your usual activities because of your asthma?
7. Symptoms of asthma include cough, wheezing, shortness of breath, chest tightness and phlegm production when you don't have a cold or respiratory infection. During the past 30 days, how often did you have any symptoms of asthma?
8. During the past 30 days, how many days did symptoms of asthma make it difficult for you to stay asleep?
9. During the past 30 days how often did you take asthma medication that was prescribed or given to you by a doctor? This includes using an inhaler.

Current review of hospital discharge data will require further analysis. Data will need to be examined to determine the rate of asthma hospitalization versus total hospital discharges, the average length of stay, asthma case fatality rate, and rates of associated or concurrent diseases. In addition, a comparative analysis of hospitalization data for asthma in relation to other disease categories must be conducted. Other possible hospital discharge data analysis such as the ratio of hospitalization days per asthmatic patient, the proportion of asthmatic patients vs. total hospitalized patients, the rate of hospitalization by month to capture seasonal trends, the cost for treating an asthmatic patient, and the case fatality rate will increase the capacity of the Department of Health to measure the burden of asthma in the District of Columbia and develop additional policy based on sound data.

Environmental triggers that affect people with asthma may include changes in weather conditions such as temperature, barometric pressure, humidity and strong winds; exposure to irritants with strong odors such as colognes and perfumes or household cleaners; occupational exposures such as vapors, dust, gases or fumes; outdoor air pollutants; and cool and dry air indoor environments. Certain airborne contaminants specifically outdoor air pollutants such as ozone and indoor air pollutants such as chemical irritants and environmental tobacco smoke can worsen a person's asthma.

The Department of Health Environmental Health Administration's Air Quality Division routinely monitors for six pollutants considered by the Environmental Protection Agency (EPA) to be "Criteria Pollutants" (carbon monoxide, lead, sulfur dioxide, fine and coarse particulate matter (respectively, PM2.5 and PM10), nitrogen oxides (NO and NO_2), and ground-level ozone (O_3). This is a national ambient air quality-monitoring network for the purpose of providing timely air quality data upon which to base national assessments and policy decisions linking environmental factors with hospitalization, Emergency Department visits, and mortality data would be the long-term goal of an environmental tracking system.

The Department of Health has established a cooperative agreement with Centers for Disease Control and Prevention to develop an environmental public health tracking system in the District. Generally, such an agreement would continue to enhance the Department of Health information systems that directly support environmental public health tracking (surveillance) functions. Specifically, the databases of relevance are those containing environmental data on human exposure and hazards and those capturing data on health effects.

The Occupational Safety and Health Administration (OSHA) estimated that 11 million workers are potentially exposed to at least one of the agents known to be associated with developing asthma. For the period 1990-1999, the National Center for Health Statistics' (NCHS) multiple causes of death files concluded that about 80% of asthma symptoms were caused by occupational exposure in a previously healthy adult, while 20% were pre-existing asthma aggravated by occupational exposure. Among work-related asthma cases, 20% were associated with miscellaneous chemicals, 12% with cleaning materials, 11% with mineral and inorganic dust, and 10% with indoor pollutants.

NCHS found that agriculture production, livestock, farm machinery and equipment were associated with the highest proportionate mortality ratios (PMRs) for asthma. Other top industries with elevated PMRs were: child day care services; drug stores; hospitals and clinics; and physician's offices. Compared with many states, the District has a limited number of industries that would fall into the high PMR categories, such as: Construction, Education, Retail Trade, Services, Federal and State Governments, Transportation.

The **DC CAN** project plans to use data sources such as the District of Columbia Office of Workers Compensation, which provides compensation for private sector employees and the District of Columbia Office of Risk Management, Disability Compensation Program,

which handles claims for District employees, to capture workplace asthma statistics. Data collection on asthma in the workplace will begin in the upcoming fiscal year.

Ultimately, the activities included in this cooperative agreement will achieve various goals and help the Department of Health in further documenting the relationship between environmental exposure and health effects. One of the most important goals is the overall opportunity to prevent and control morbidity and mortality related to environmental factors in the District. Future efforts will be centered on the relationship between asthma hospitalization data by zip code in relation to sites of EPA exposure/observational sites.

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